Rubber Boa (*Charina bottae*)

Rubber Boas generally are nocturnal and so less readily encountered compared to diurnal snakes such as Racers and Gopher Snakes. They occupy a wide range of habitats throughout Idaho from sagebrush desert to montane forest. Nussbaum et al. (1983) show no records of Rubber Boas in Butte, Custer, or Lemhi counties. Our museum records indicate an observation of a Rubber Boa in 1966 a few miles southwest of Clayton (NIHD). Prior to 1996, BLM personnel reported observations of Rubber Boas both in Lemhi and Custer counties (Fig. 13, Appendix I). We encountered a Rubber Boa near the buffalo jump turnout along Highway 75, a couple miles south of Challis. P. J. Smith reported finding Rubber Boas north of Salmon on Diamond Creek and 4th of July Creek, and at the junction of Mill Creek and Challis Creek roads north of Challis. Roy Churchwell (pers. commun.) reported Rubber Boas on Herd Creek and Morgan Creek. Other local residents reported Rubber Boas in the study area or nearby.

Racer (*Coluber constrictor*)

Racers inhabit areas of open vegetation -- grassland, sagebrush desert, meadows, and open woodland, and are generally absent from forests and high mountains (Nussbaum et al. 1983). They are the only snake species in Idaho whose young have different color patterns from adults (juveniles are blotched anteriorly while adults are uniformly brown or olive above). Nussbaum el al. (1983) do not show Racers as occurring in Custer or Lemhi counties, nor are there museum records showing its occurrence in these counties. Racers have been recorded in southeastern Butte county and near Big Southern Butte (NIHD). There is one observation from BLM personnel in 1993 of a Racer in Lemhi county near Cow Creek (Appendix I). We received an observation of a Racer also in the Cow Creek drainage from a local resident. We encountered three Racers, one a juvenile, in the Challis RA in Spring Gulch north of Challis (Fig. 14, Appendix I).

Gopher Snake (*Pituophis catenifer*)

Gopher Snakes are found in a variety of habitats from desert to coniferous forest, although usually not at high elevations or within dense forest (Nussbaum et al. 1983). They've been reported from the northwestern border of Lemhi county, in Butte county near Arco and Moore, but not in Custer county (Nussbaum et al. 1983, NIHD). We encountered an adult at the northern end of Grandview Canyon in the Challis RA in June, 1997. We've also received reports of Gopher Snakes observed near Ellis (Fig. 15, Appendix I).

Western Terrestrial Garter Snake (*Thamnophis elegans*)

Western Terrestrial Garter Snakes, which inhabit a wide variety of habitats throughout Idaho (generally near water), are the most common snake species in Idaho, and the most common and widespread snake species encountered in the study area. Nussbaum et al. (1983) present sightings for Butte and Custer counties but not Lemhi county. We commonly encountered these garter snakes near wetland habitat in both Custer and Lemhi counties (Fig. 16), many times associated with spotted frogs. Western Terrestrial Garter Snakes were the only amphibian or reptile that we encountered in the Lost River Range.

Common Garter Snake (*Thamnophis sirtalis*)

The Common Garter Snake, although the most common species of garter snake in North America, is not common within the study area with only one observation reported by Nussbaum et al. (1983) in Lemhi county. Museum records show a Common Garter Snake collected just south of Carmen, in Lemhi county (NIHD, Fig. 17). P. J. Smith reported encountering "20-30" Common Garter Snakes in Lemhi county over the years, particularly in the Kirtly Creek and Freeman Creek drainages. He has not found any in Custer county. We encountered one Common Garter Snake at the Morgan Bar Recreation Area north of Salmon in June, 1997 (Fig. 17). We also observed a garter snake swimming in Summit Creek in the Little Lost River Valley that might have been a Common Garter Snake but we were unable to identify the species.

Western Rattlesnake (*Crotalus viridis*)

Western Rattlesnakes are widespread in Idaho although Nussbaum et al. (1983) do not report them from Custer county, nor did we find museum records of their occurrence in Custer county. Despite the lack of records, rattlesnakes are widespread although not commonly encountered within the study area (Fig. 18).

Based on our discussions with local residents and evidence at reported den sites within the study area, rattlesnake dens have experienced persistent persecution over many decades. Several residents reported destroying snake dens -- using dynamite to destroy den openings, igniting fuels poured into den openings, burying dens with bulldozers. Many residents consider killing rattlesnakes a civic duty -- each spring and fall killing dozens of snakes as they gather at traditional den sites. Several species of snakes (e.g., Western Rattlesnakes, Gopher Snakes, Racers, Western Terrestrial Garter Snakes) may den communally. Therefore efforts to eradicate rattlesnakes also may kill other species of snakes.

We attempted live trapping at a reported den site in Birch Creek, a few miles southwest of Challis during April and May of 1997. We were unsuccessful although we encountered a Western Terrestrial Garter Snake shedding its skin at this site.

Management Recommendations

1. ***Continue gathering and reporting data on amphibian and reptile observations.***

Although our knowledge of the herpetofauna of east central Idaho has been significantly increased by the current study, it is still incomplete. The careful recording and reporting of observations by agency personnel and local residents can be one of the most important sources of information concerning the local distribution of amphibians and reptiles. It is often possible to easily integrate reporting herpetological observations into current activities (e.g., fishery surveys). Actions that will encourage the reporting of observations include: (1) training on how to identify amphibians and reptiles; (2) the provision of data forms and reference materials; and (3) a local contact person responsible for collecting reported observations and forwarding them to the Northern Intermountain Herpetological Database at the Idaho Museum of Natural History. The Herpetology Laboratory at Idaho State University can provide assistance with these activities in a variety of ways. Information on identification, data forms, distribution, conservation issues, snake bite, surveying and monitoring procedures, current research projects, courses and workshops, etc. will be available on the ISU Herpetology Laboratory Web Site (http://www.isu.edu/~petechar/herplab/hlmenu.htm). The Herpetology Laboratory also can provide training and can answer questions on the ecology and conservation of amphibians and reptiles.

2. ***Conduct further surveys.***

Further surveys of streams for Tailed Frogs and continued searches for snake overwintering sites would be important extensions of the current study. Surveys of caves for subfossil amphibians and reptiles might provide useful information on what amphibians and reptiles occurred in the study area in prehistoric times. This might be particularly meaningful in the Lost River Mountains to evaluate the question of whether amphibians ever occurred there.

3. ***Monitor selected sites at a 5 to 10 year interval.***

Regular monitoring of the occurrence of various life stages of amphibians and reptiles at a subset of current sampling sites would provide information crucial to long-term management of amphibians and reptiles. Because relatively few (i.e., 22) of the current sites were occupied, all of these sites would be used for monitoring, including the Chilly Slough and Birch Creek Conservation Areas. If overwintering areas for snakes are discovered in the future, these sites should be incorporated into the monitoring program. It also is necessary to include sampling sites where amphibians and reptiles were not found to allow for the possibility of population increases or changes in site occupation. Selection criteria for these sites would include stratification by management area, cover type, and elevation. Specific recommendations for monitoring sites are included in Table 4. We recommend that monitoring be conducted at 5-year intervals, if possible, but at no longer than 10 year intervals. The actual fieldwork, data management, analysis, and report writing could be performed by agency and/or Herpetology Laboratory personnel. Ideally, a monitoring program for east central Idaho would be integrated

into a state-wide monitoring program for amphibians and reptiles. Well-documented data, archived in accessible GIS databases, are essential to building a foundation for understanding of the consequences of land management actions on amphibian and reptile populations.

4. ***Avoid stocking any currently fishless wetlands with fish.***

Research in Idaho and elsewhere indicates that introduced fish can eliminate or significantly reduce amphibian populations (Koch et al. 1997, Munger et al. 1997, Pilliod and Peterson 1997). Most of the lakes in the Lost River Range have been stocked. Brook trout and possibly other fish have been stocked in Chilly Slough, Birch Creek, Summit Creek, and other wetlands and streams in the Challis RA and Lemhi RA. There are reports of tropical fish having been dumped into Barney Hot Springs near Summit Creek (where spotted frogs have been reported in the past), or escaping from a commercial fish farm south of Challis and breeding in irrigation ditches in the Challis RA. Because of the probable negative effects of the introduction of fish on native amphibians, we recommend that agencies take actions to prevent currently fishless waters from being stocked with fish.

5. ***Protect any isolated wetlands with amphibians.***

Because there apparently are so few sites in the study area inhabited by amphibians, we recommend that agencies try to protect all of these sites. Livestock grazing on public lands can have variable effects on amphibians. The creation of stock ponds and light grazing around densely vegetated wetland can increase opportunities for amphibian reproduction. Conversely, livestock overgrazing and trampling can destroy wetland potential for amphibian use, lower water tables, and dry up wetlands. Diversion of springs and streams for water troughs and irrigation also can eliminate habitat (e.g., hibernacula at springs). Although current management policies focusing on proper use of riparian habitat may achieve adequate protection of fish habitat, we recommend that allotment plans also consider strategies to protect amphibian habitat. Ephemeral ponds such as those near the abandoned South Butte mines which harbored hundreds of Long-toed Salamander larvae, permanent breeding ponds evidencing diverse and abundant amphibian populations (such as the pond in Bear Creek on the Challis RA and the pond near the Ramsey Mountain road in the Cow Creek drainage on the Lemhi RA), should be protected from intensive livestock grazing. If trampling or grazing appears to be a problem, fence off part of the wetland. We also encountered wetland sites that had been fenced in the past to exclude livestock but where the fences were no longer intact (e.g., Mud Lake, Grouse Peak Lake). Wetland exclosures need to be maintained and monitored. It is also important that amphibian sites not become so overgrown with vegetation that they are no longer suitable for breeding.

6. ***Support/promote public education efforts concerning snakes to reduce persecution of snake populations.***

Persecution of snakes appears to be an important threat to snake populations. We repeatedly encountered reports of destruction of snake dens (by blasting, torching, or burying) and killing of snakes at dens and elsewhere. Although the aim may be to kill rattlesnakes, such persecution probably affects other species of snakes (such as Racers, Gopher Snakes, and Western Terrestrial Garter Snakes) because they may communally den with the rattlesnakes. Because snakes may annually migrate distances of up to 8 km (5 miles) one way, destruction of den sites may affect an area of many square miles. This is a difficult management issue but some means to stop persecution of snakes, particularly at den sites should be implemented.

Public education, concerning the ecological roles and economic benefits of snakes, an assessment of snake bite risk, how to minimize the occurrence of snake bite, and first aid measures, is probably the most effective long-term solution to this problem.

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